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Acquisition of Levantine Arabic Word Stress

According to prosodic hierarchy accounts [1], the acquisition of word stress follows stages based on the *prosodic hierarchy*: syllable > foot > mora > prosodic word. Arabic is quantity-sensitive with bimoraic trochaic feet, and primary stress is roughly assigned to the rightmost foot in a word [1-2], which can be in different locations: e.g., [burtu'qa:l] 'oranges', ['madrasa] 'school', [ʔan'ni:ni:] 'bottle.' Thus, Arabic children must be in the more advanced stages to produce word stress correctly, and we would predict late development for Arabic stress. Daana [3] reports that 2-year-old Jordanian-Arabic learning children produce real words with correct stress but are often truncated, while 4-year-olds produce the full words with correct stress location. The 2-year-olds delete the unstressed syllable preceding stress more often (e.g., [za'ba:l] > ['ba:l] 'cleaner') than the syllable following stress (e.g., ['ka:se] > ['ka:se] 'glass'). Given these finds, Daana proposes that at 2 years, Arabic-learning children have access to the foot but not the prosodic word, while she does not mention mora. Since Arabic feet are moraic, productions like ['ka:se], point to 2-year-olds producing constituents larger than feet. Children produce the location of stress correctly at 2 years, however, since Daana used real words, we cannot know if the children's correct productions are the result of a systematic application of the stress rules or memorization of the pronunciation of individual words.

In the present study, we test the perception and production of nonce and real words in children learning Levantine Arabic and in adults to explore **which components of the Levantine Arabic stress system develop in 3 – 5-year-olds**.

We designed a word-learning game in E-Prime where participants help a character practice their Arabic words, some of which they know (20 real words) and some they have not heard before (10 nonce words). Their task is to listen to the word the character says (3 repetitions) and indicates if they produced them normally or not, and then to produce the word themselves. We constructed nonce trisyllabic words that should be stressed on the first, second, or third syllable. We recorded these words produced with the correct stress, and with incorrect stress on the other two syllables. See the table below where bold indicates the location of the

produced stress. We used real words as filler items and those were correct [sa.'fii.ni] 'ship', with wrong

| Nonce words | N | Stress Syll 1 | Stress Syll 2 | Stress Syll 3 |
|--------------|------|----------------------|-----------------------|---------------------|
| 'CV.CV.CVC | (x3) | 'ba.ta.kib | 'ba.ta.kib | 'ba.ta.kib |
| CV.'CVC.CVC | (x2) | ta.'dab.nat | ta.' dab .nat | ta.'dab.nat |
| CVC.'CVC.CVC | (x2) | bak .'tub.nak | bak.' tub .nak | bak.'tub.nak |
| CV.CV.'CVCC | (x3) | ta.ka.'tabt | ta. ka .'tabt | ta.ka.' tabt |

stress [ba.'taa.**taa**] 'potato', or with a segment error ['sa.ma.t/ki] 'fish'.

Preliminary data from 5 adults and 3 children show that adults perceive stress errors in real words (78% accuracy), but child ratings are close to chance (48% accuracy). Nonce words are overall rejected by adults as they marked only 22% of the correctly stressed words as "correct." Children were more willing to accept the correctly stressed (67% marked "correct") and incorrectly stressed (80% marked "correct") nonce words. In their productions of real (Adults = 98%, Children = 67%) and nonce words (Adults = 84%, Children = 64%), both adults and children place stress on the expected syllable based on Arabic stress rules, but children are not as accurate as adults. Pending more data collection (aim to test 30 in each age group), statistical analyses will be prepared, and we will discuss the implications for prosodic hierarchy accounts.

References

1. Demuth, K., & Fee, E. J. (1995). *Minimal prosodic words in early phonological development*. Ms, Brown University and Dalhousie University.
2. Hayes, B. (1995). *Metrical stress theory: Principles and case studies*. University of Chicago Press.
3. Daana, H. A. (2009). *The development of consonant clusters, stress and plural nouns in Jordanian Arabic child language* (Doctoral dissertation, The University of Essex).